VHFER

50 MC. AND UP

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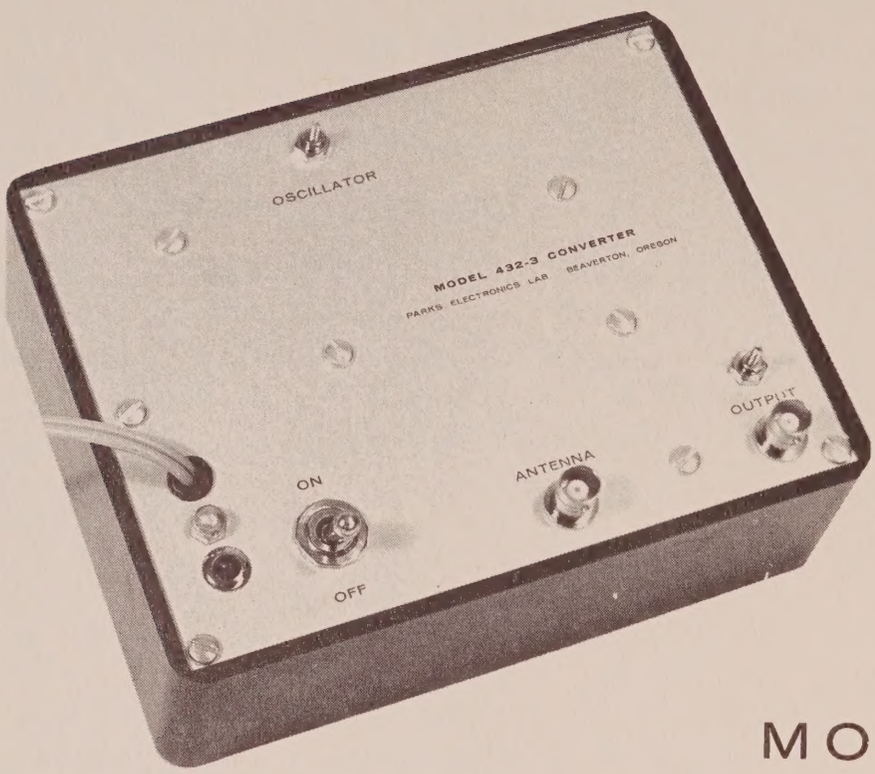
Volume 4, No. 8 Nov.-Dec. 1966

F1EZ'S HOME-MADE DISH

A 432 DX MAN'S CONVERTER



MODEL 432-3

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--All solid-state design
--Zener-regulated a.c. power supply
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This converter uses the Texas Instruments TI-XMO series transistor. We pick the best from the 01 and 06 types to give you performance equal to or better than the general run of the former TIXMO5, apparently no longer available---at least for now. From our tests these transistors are superior in performance to the 2N3399 we formerly used and cost much less. They're also less expensive for you to replace if you damage them with r.f. This converter has a tuned input, something our previous converters and preamps did not have. It cuts down on interference from other stations in the big cities.

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ROUTE 2 BOX 35 BEAVERTON, OREGON

Moonbounce Newsletter

by Victor A. Michael, W3SDZ
Box 345, Milton, Penna.

In the "wee small" hours of the morning of November 28th 1966, a group of New Jersey moonbounce enthusiasts sat huddled around a Collins 51J4 receiver--their giant 60 foot dish aimed at the setting moon. At exactly 1010 plus 30 seconds the first weak signals came forth from the speaker. In the next three minutes the signals peaked to their strongest, and in another three minutes they faded back into the noise. In that historic six minute period the Crawford Hill VHF Club (operating K2MWA/2) made the first two-way two meter contact with VK3ATN in Birchip, Victoria, Australia.

Needless to say, the work of VK3ATN has been well written about in this column and in all the other amateur publications. Despite the fact that Ray was getting good echo returns from his stacked rhombic array in Australia, there were few "takers" on the U.S.A. side. There was the noble effort of K6MYC, but no two-way despite several months of trying. To be sure, the power limitation at VK3ATN was one problem, for he was hearing K6MYC quite well with 1KW on the K6 end of the path. Obviously it was going to take a really big antenna to do the job, and the antenna at the Crawford Hill Club is BIG---60 Feet Big!

I'm sure a run-down on the equipment in use will be of interest at this point. The Crawford Hill group had the legal limit of transmitter power with 650 watts output from a GE6183 in a half-wave-line circuit. Frequency was 144.088.

The receiver started out with a KMC transistor preamp and large coax input filter to subdue "out of band" signals. The preamp was mounted at the rim of the dish. 100 feet of RG58 connected the preamp to the converter in the shack. The receiver was in turn a Collins 51J4 that had a 3KC bandwidth. An audio filter with a 300 cycle bandwidth followed this. The receiving system input noise figure was 2.8 db with the coax filter. The antenna temperature was estimated to be 300 degrees K.; therefore, the system operating noise temperature was something greater than 600 degrees K or about 4.9 db.

The antenna was a 60 foot commercial parabolic antenna with crossed dipoles and reflectors--each dipole fed separately thru a phasing and switching harness which permitted polarization switching from right-hand circular to left-hand circular. Feedline consisted of 1 5/8" Styroflex from the focal point to the rim of the dish. On transmit an additional 75 feet of air line was used to the shack. On receive the preamp was mounted at the rim as described earlier.

The VK end of the QSO has been described before, but briefly, four stacked rhombics (leg length in excess of 300 feet) served as the antenna. The receiver had a noise figure in the 2 to 3 db region, and the transmitter was limited to 150 watts input.

Now the important part of all this is an evaluation of the results achieved with the systems in use. The VK's signals peaked at no more than 6 db out of the noise in the 300 cps band-width at the U.S. end, while the signals of K2MWA/2

were better than 18 db out of the noise at Ray's end. Since the K2MWA group was getting its own echoes back at about the same strength as they received the VK signal, you can plug in a few numbers and find out that Ray's stacked rhombic does indeed work--probably some 10 db better than the Crawford Hill dish--and the dish has an honest 26 db gain. Now will you believe me when I say it takes a really big antenna to get results?

The Crawford Hill club also ran some echo tests and tried listening without switching the sense of polarization. The result of the test is that you must be able to switch sense of circular polarization if you want to hear your own echoes. To work the VK on two meters you need a well-measured "state of the art" rig feeding a 26 db or better antenna.

Before we get off the Crawford Hill VHF Club, I would like to mention the people behind the operation. While he is probably too modest to admit it, W2IMU--Dick Turrin was the ring leader of the group. Of course he had a small but very ambitious group to ring lead--Ed Chinnock, W2FZY, Bill Schober W2JIB, and Roger Abson (who has no call--only because of license policy in the U.S.--Rog is from England). Dick and Rodger have both been to the W3SDZ QTH on several occasions to help with the rigging of our system.

Whenever a new record is set, there are always some guys around who will say, "I wish I had known about this before so I could have had a chance at it". Well, there was enough printed about the VK activity on two meters, but just in case there are some who still feel they were left out, I'm going to tell you what Ray would like to do next. He has now worked the USA on all amateur bands from 160 meters through two meters except for six meters. While I don't have all the details at this writing, Ray thinks his rhombic array can be tuned up for six. The antenna would aim a bit differently than it did on two, but would hit the moon in nearly the same position. It will take a really giant array to do the job. A gain in excess of probably 23 db will be needed on six meters--maybe more on account of the higher antenna temperatures involved. It will take a sizable bit of real estate to do the job. I can state further that the Crawford Hill Club will not be trying on six--in fact they probably won't be heard from again until they get their 1296 MC system working on the sixty-foot dish (when that happens a really small dish will be able to work them).

Dick has offered to help me design a stacked-rhombic array to make the six meter try with Ray. We won't be ready until spring on account of the weather, so anyone in the warmer parts of the country can easily beat us. In a way I hope someone else will pick up the challenge, as we are also working on our 1296 MC system. A side effort for six will slow this down.

Speaking of 1296, I think this is going to be the next best band to think about in tooling up a moonbounce effort. Experiments are now underway on the East Coast using a readily available klystron that can generate power on 1296 quite easily. The only difficult part is the power supply--about 10KV is needed at some reasonable amperage. Since the experiments are still experiments, I don't want to comment further. But if this all works out, information will be available in this column first.

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I'm writing this a few days before Christmas, and even though this will reach you after the holidays, I want to wish all of you the very best in the New Year. I want to thank all of you who wrote to me. If I didn't answer your letter, it was the press of too much work on this end--nothing else. We are in the process of adding an FM Stereo station to the AM radio station I own, along with building an entirely new studio complex. Add to this the fact that we're still rebuilding the farm house and I spent several weekends speaking at Ham Conventions, and you can realize that even my wife and four children get a little discouraged about the amount of "spare" time I have. End.

K6MYC REPORT

Report on the Nov. 1 and 5 moonbounce attempt by K6MYC & VK3ATN.

For Nov. 1 both ends appeared ready but results on both ends were negative. Ray did not even hear his own echoes nor did we. It looked like a problem of Faraday rotation. This had been considered the best of the two days and all concerned were very discouraged.

Again on Nov. 5 all was in readiness and we began hearing our own echoes about 10 minutes prior to sked time (1600-1622 gmt) at 1558. We began calling Ray and continued until 1600. At approx. 160010 we began hearing ray's signals about 150 cycles above our freq. Copy was poor because of the effect of libration fading. We could tell from the pattern of Ray's transmission that he had heard us call at 1558-1600 and was answering us. No complete calls were copied nor was Ray's signal report to us copied. Because of the fading only portions of letters came thru. The next two transmit and listen periods went approximately the same way with our own echoes banging thru during breaks in our transmission. The rest of the sked we heard nothing. This has happened the last two months with our own echos beginning early (10-15 min.) before sked time and fading out about half way thru. We apparently have a slight azimuth skewing and this will be corrected by repositioning the array for Nov. 28 and Dec. 2 skeds. Later on Saturday, Nov. 5, during the 15 meter sked with Ray he disclosed that he had heard us at 1559 calling him but copy on his end was also poor although on our second and thir transmission periods he copied enough to get calls and our signal report to him. He did not, however, get his own echoes which confirmed that our receiving system was finally working as it should.

Next month (Nov. 28 and Dec. 2) according to Ray will be the best times for him since April when he received his best echos. Both days have the moon almost centered in his beam and the declinations for both days are almost identical (23 deg. 57' and 23 deg. 56'. Barring equipment failures we should make at least one good two-way at that time. K6MYC

Following is a letter from K6MYC to K7AAD received December 20.

Here's the results for Nov. 28 and Dec. 2 moonbounce tests. On Nov. 27, Ray asked me via our 15 mtr. sked if it would be alright if he concentrated on K2MWA/2 at the Bell Labs on Nov. 28 since this would be possibly the last time K2MWA/2 would be on 144 MHz. I consented & hoped that there would be time for two QSOs that day during Ray's 22 minute window.

We (Tay Howard W6UGL) and myself were out raring to go at 1:45 a.m. in drizzling rain. At the beginning of Ray's first transmission period we copied Ray & heard him calling K2MWA/2. We heard K2MWA answer on 144.088 but of course I was also transmitting during each of K2MWA/2's transmissions on 144.090 so it was difficult to copy their transmissions. At the times that we did pause to listen, their circularly polarized signals from their 60' dish were Q3-4 most of the time as was Ray during the first 4 of his transmission periods. Then Ray faded out & we didn't hear him again until the last minute of his window. We continued hearing K2MWA/2, so 2-3 minutes after Ray was gone we moved down to 144.088 & gave K2MWA/2 a call. He answered thinking we were VK3ATN & gave us a 3. We sent the same but knew he was not copying our call. Their next transmission they sent 2s & we sent the same on our transmission. We heard nothing after that. K2MWA/2 & VK3ATN did however make the first USA-VK land contact on two meter moonbounce. Unfortunately K2MWA had antenna problems & missed two transmission periods about in the middle of the sked & Ray spent valuable time trying to make sure that K2MWA/2 had heard him well enough for a legal two way. Thus Ray never took more than a few short listens for our signals on 144.090. Ray says at the times he listened he did not hear our signals. We were, however, receiving our own echoes right to our last transmission. Overall conditions were good & Ray's signals were the best we had ever heard from him & we wish to congratulate Ray, VK3ATN & all the boys at K2MWA/2 for finally making it on 2 meters.

Dec. 2--The moon was in exactly the same position and again we expected good conditions--Ray's signals were copied again on his first transmission & he had called us on our frequency so we knew he was hearing us. Spirits were high for a few minutes but signals got very little better on Ray's second transmission. On his third transmission he was almost gone and we hadn't even reached the mid point of the sked. We sent 2s our first 2 transmissions and that was as good as it got. So we'll have to try again and just hope for some good luck for a change. We (Ray & I) plan to try on Dec. 25 but the moon is not too favorable for Ray. End.

432 MHZ. TRIPLER PARTS KIT

Here is a parts kit for the 432 MHz. rig described in the Sept. '65 VHFER. You can buy all of it or any part. It's done in commercial fashion--nicely built. Over 30 of them have been sold from VHFER advertising. Remember, it's a tripler. Put in 144 and get out 432 up to 40 watts. Ad copy by K7AAD. Send all queries to Deane Kidd, W7TYR, 12235 S.W. James, Tigard, Ore. 97223

Kit of all parts and materials except 4X150 tube ----$40.00.
Same as above, less blower ---- $30.00.
Same as above less blower and socket ---- $20.00.
432 tripler wired and tested with 4X150 tube supplied by buyer, no blower -- $40.00
Blower -- 100 CFM 115 v. a.c. 60 cycle --- $10.00.
All prices shown are prepaid, parcel post within the U.S.

TESTS ON TWO 432 MHZ J BEAMS

by Loren Parks, K7AAD

As older subscribers to VHFER know, we have 432 antenna measuring contests on the west coast every year, the results of which are published in VHFER. I have an antenna that has been in 3 such contests (the Gibson yagi) which gives me a reference for comparison with "the best in the west." The antennas which win the contests are the big colinears. Quad yagis have come up rapidly in popularity with Ed Tilton's design published in QST. They work very well. Ones I've seen were built on a wooden frame--not the best thing in some climates. The ham who can't or doesn't want to build his own antenna has had a problem, whether he knows it or not. Commercial antennas for 432 entered in previous contests have had very poor gain. As I recall, we found two of the most highly advertised ham antennas actually had NEGATIVE gain at 432. It was later determined that they did have gain at 420 but there was nothing in the kit to indicate that they wouldn't work at 432. How many of these antennas are in service at 432 is hard to say. Certainly a lot of owners must have wised up and gotten rid of them when they found they had more gain off the back than the front. Keep in mind that the performance of a yagi antenna tuned for maximum gain falls off rapidly when you get above its design frequency. Its not nearly so bad on the low side.

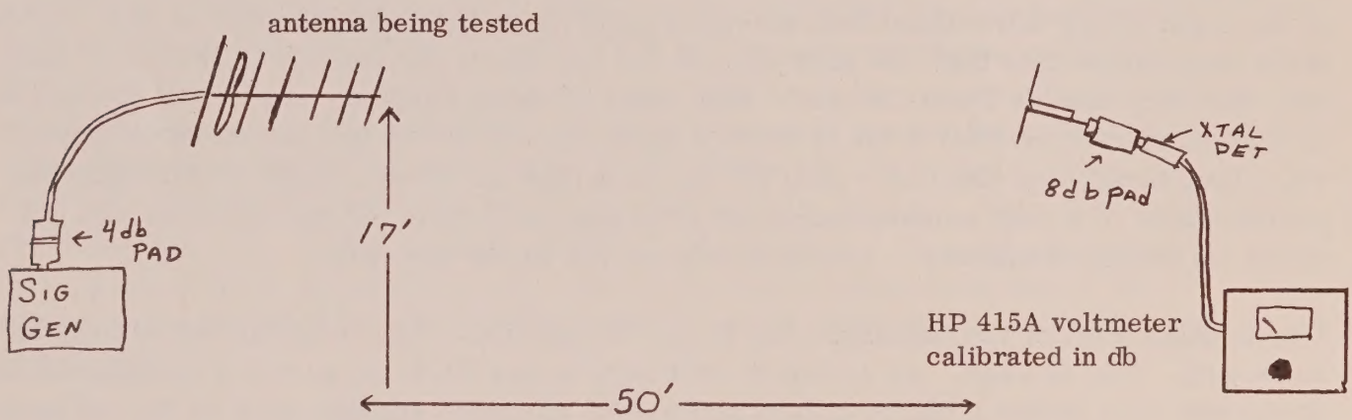
I have made a lot of yagi antennas for 6, 2, 220 and 432. 432 is by far the hardest to work with. 220 is easy. As a rule it isn't hard to get 10 db or so out of an antenna but above that it is really a fight--unless you use an aperture antenna such as the colinear or a quad of yagis and I've seen a number of those that were n.g. For these reasons I would certainly discourage antenna building at 432 for the beginner unless he follows the colinear design in the Frank Jones handbook (extended-expanded) or Ed Tilton's design. From what I have observed at contests there is only one commercial antenna that's any good at 432 and it is made in England by J beams and handled by Gain, Inc. of Chicago. You can find the ads in the ham journals.

The purpose of the tests I've just completed was to evaluate the 14 element J Beam for 432. Bill Roberts of Gain said this model wasn't their super-duper but he would stand or fall on the merits of this one. I assure you there is no collusion. I compared this antenna with a smaller J beam which didn't do so good in a contest and with my Gibson antenna and a copy of the Gibson a friend made plus comparison with a dipole to get a rough idea of the gain. By referring to previous contest results you can see how the J beams rate. I will describe how the measurements were made so if you think they are N.G. you can discount the whole thing. Let me say at this point that I am fully aware of the fact that there are more self-acclaimed experts on antennas than there are people who have attempted to measure antennas. There is something about no experience that makes some people all-knowing. Most hams don't have the know-how or equipment to do any kind of a job. And even with good equipment there are plenty of pitfalls. What I will describe is a method using reasonably good equipment under reasonable conditions to get a semi-quantitative or at least comparative result. You can see I'm hedging all over the place because I am fully aware of a number of criticisms that could be made, and rightly so. In spite of this I believe the results obtained are sufficiently accurate for amateur purposes. You are not concerned whether an antenna has 9.1 or 9.2 db gain over a dipole, but whether it has 6 or 9 db over a dipole. I would guess my measurements would be within 1 or 2 db of the true figure OVER A DIPOLE, not over an isotropic radiator which many ads quote (subtract 2 db to compare with dipole), (and another 3 or 4 db for advertising).

Antenna testing as done by hams usually suffers from one or more of the following sources of error.

1. Reflections from the ground or other objects which add or subtract from the directly received signal, depending on phase relationships.
2. Mis-matched terminations which cause the length of the transmission line to affect measured performance.
3. A bad readout, such as an un-calibrated S meter.

The method I used was to transmit with the antennas being tested (often a risky procedure) and receive with a dipole as shown below. The separation was such that energy from the beam striking the ground in front of the receiving dipole was negligible. With the dipole used to transmit and make the gain comparison this was not true.



The signal generator was terminated in a 4 db coaxial pad and then about 15' of RG 58/U was run to the antenna under test. The purpose of the pad is to more or less isolate varying antenna loads from the signal generator. It absorbs over half the output signal and provides a "more certain" 50-ohm source for driving the antenna. 10 db is a safer value to use butaat the time we didn't feel we could spare the power and it was pretty certain that the antennas were well matches so there would be minimal reflections on the line and therefore minimal effect of cable length on antenna performance. In an antenna contest I would put the pad at the far end of the line and use 10 db.

At the receiving end the dipole feeds an 8 db coaxial pad (Stoddart) and then a coaxially mounted germanium diode. The diode then is driven by a 50-ohm source almost irrespective of the impedance of the dipole. In this case I doubt that the pad is very essential. Its inclusion is to prevent possible objections. Nobody would say the pad hurts anything. Pad and detector are mounted right at the dipole. The RG 58 line carries only the 1 kc. modulation (no r.f.). The meter scale on the HP415A is calibrated for the square-law characteristics of a diode at low signal levels. Use of a 1 kc. tone eliminates possibilites of drift in d.c. amplifiers and also r.f. pickup from nearby FM and TV stations, which are bothersome at my locations using other methods. A transistor oscillator-multiplier can furnish sufficient signal strength. Tone modulation is about 30% at 1 kc. W6VSV has a nice one he built he should describe in VHFER.

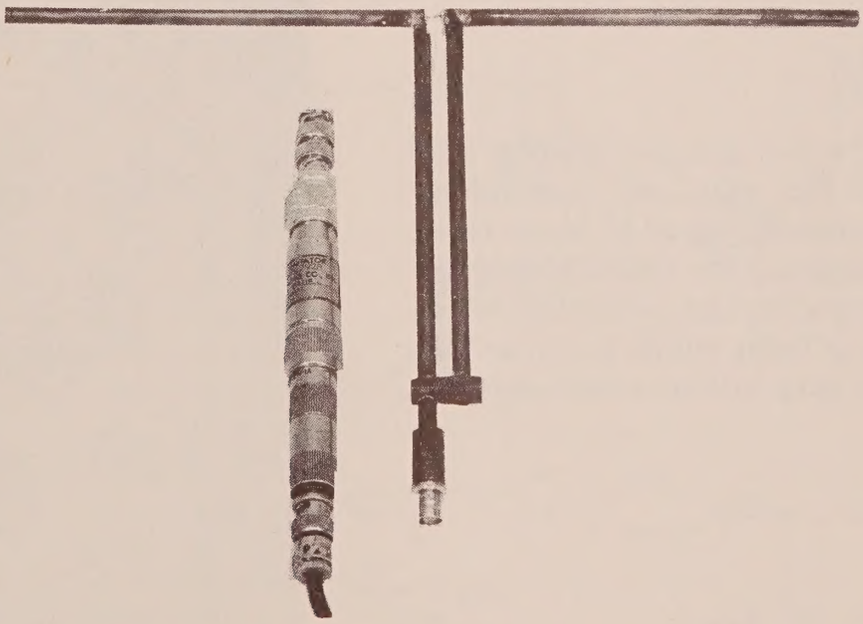
First I transmitted with a dipole to get a DB reading on the meter at the receiving end. This was the reference. Since the meter is calibrated in decibels it was simply a matter of changing antennas at the transmitting end, peaking for maximum reading (which was always straight toward the dipole as far as I could see) and reading the meter. I kept the forepart of the antennas at a constant distance from the receiving dipole. The results are shown below. All antennas used 1/4" aluminum elements.

14 element J Beam	9 ft boom	12 directors,	4 reflectors	9 db over dipole
Gibson yagi	6 1/2 ft "	13 "	1 "	8 " " "
10 el. J Beam	5 ft. boom	8 "	1 "	7 " " "
copy of Gibson	6 1/2 ft "	13 "	1 "	6.7 " "

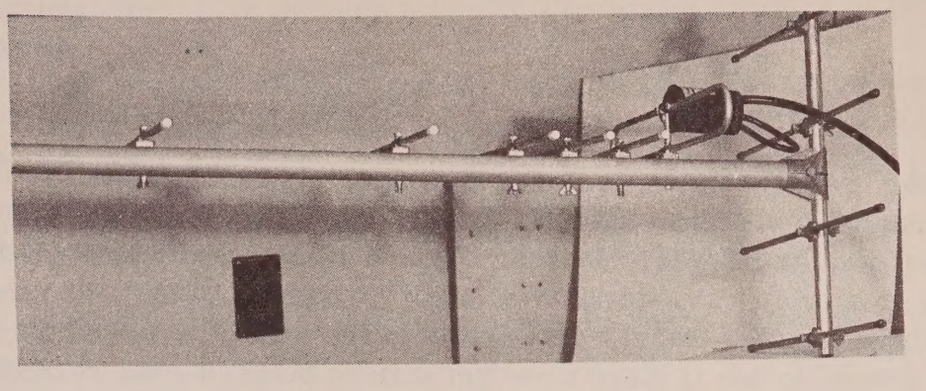
Now the painful part must be done--the interpretation. I should say that we first tried this with the transmitting antennas near the ground, shooting up at a 20 to 30 degree angle first and got similar results. We didn't keep a record as I was not satisfied that all were getting a fair trial. I re-tested the big J Beam after testing the others at the elevated transmitting location and got exactly the same result. I moved the antennas up and down and around to see if there were reflections bothering the readings and it seemed there was not much variation. I also moved the dipole around and got little variation.

There is no question but what the 14 element antenna is best, as it should be, because of its longer boom. Now 1 db over the gibson may not sound like much for an increased length of 2 1/2 feet, but keep in mind that under ideal conditions you double the boom length to get 3 db increase. Realizing that much increase is another matter--it ain't easy. Percentage wise the Gibson is quite a bit longer than the small J Beam, and the difference shows. Why the copy of the Gibson didn't work out I don't know. I inherited it, I didn't build it. The guy who did is quite skilled at antennas and I don't know that I could have done any better or as well. It points up the difficulties at 432.

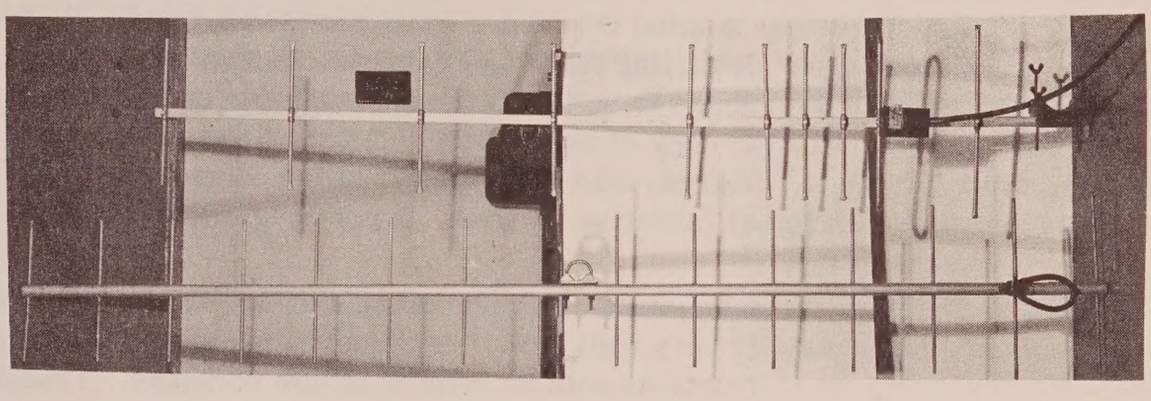
CONCLUSION: The first three antennas are performing about as well as can be expected. The J Beams are mechanically very well built. Assembly time was 10 to 15 minutes. There were absolutely no instructions with it, typical of this company. I must say it was almost completely pre-assembled so an idiot could put it together with only one or two questions. I wondered if I had the reflector assembly on right with the el ements forward. I figured if I didn't have it right it was their fault for not sending instructions. This is the best commercial antenna I've seen and I wouldn't hesitate to recommend it. It isn't going to perform like an extended-expanded 32 element colinear. It doesn't have the capture area. For its size it does OK. The Gibson antenna is no longer made.



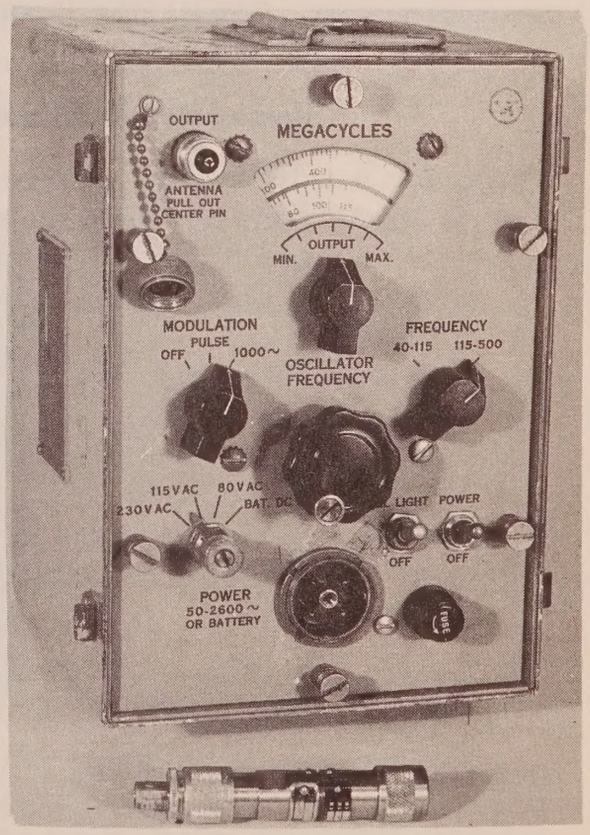
Receiving dipole, coaxial 8 db pad and coaxially mounted crystal detector. The dipole is driven by the 1 to 1 parallel rod balun. Transmission line center in one leg of balun has had small segments removed from the polyethylene dielectric to make a match. Reference dipole is the same.



Part of the big J Beam (14 elements). They only count one of the reflectors as an element. The black plastic can is the housing for the coaxial balun assembly.



The small J Beam (upper) and the Gibson Yagi.



The TS47A/APR, a real gem for antenna testing. 40 to 500 Mc. with 1 kc. modulation. Calibration is remarkably good at bands other than 432. We monitored the output frequency in a receiver using a crystal-controlled converter to be sure of being within a few kc. of 432. The drift is very low for a self-excited oscillator.

A STATION PROGRAMMER FOR METEOR SCATTER WORK

by Donald L. Hilliard, WØEYE*

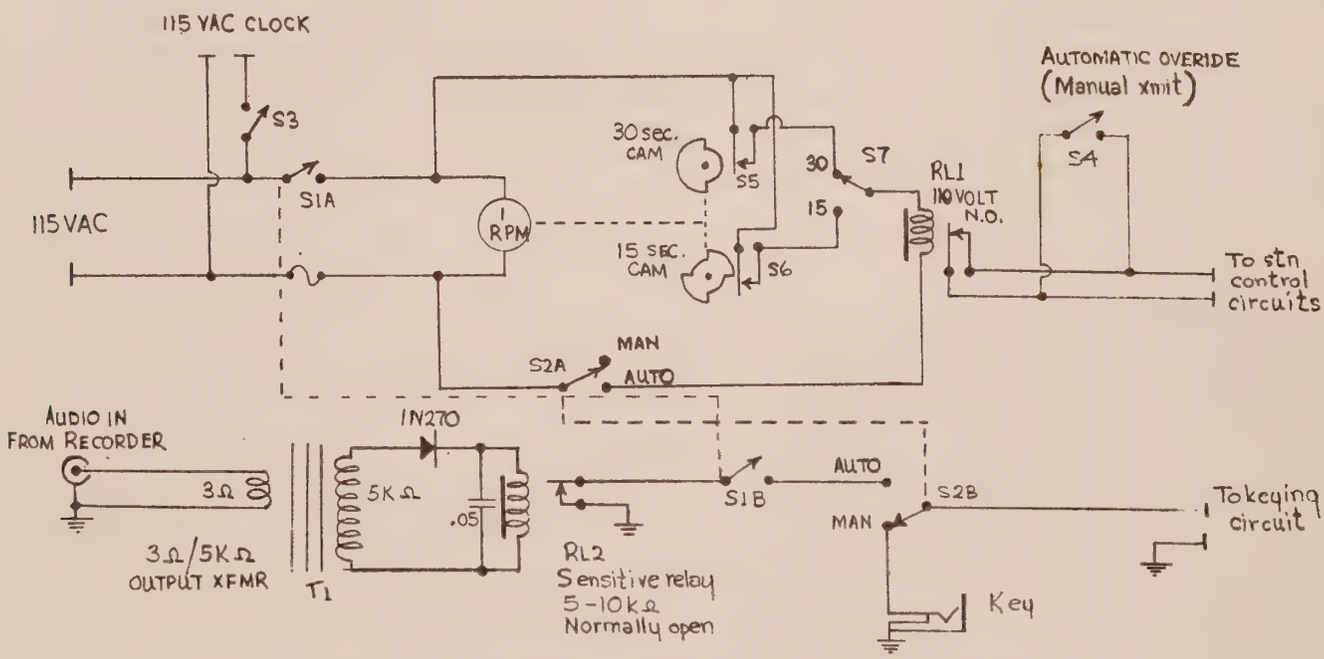
It is surprising that more meteor scatter enthusiasts don't use some method of automatic operation. A unit such as the one described here, plus a tape recorder, can take most of the work out of meteor schedules. This unit will sequence the station equipment at either a 15 or 30 second rate and when used with a tape recorder or other audio code device will do all code sending at the operator's choice of speed. This is truly automatic operation.

CIRCUIT DESCRIPTION

A one r.p.m. synchronous motor is activated by S_1 A. Two cams are attached to the shaft of this motor. The cams in the WØEYE unit are about 2 1/2" in diameter and made from 1/16" aluminum. A nibbler can be used to cut out the desired portion. Microswitches S_5 and S_6 are activated by these cams. Switch S_7 selects either a 15 or 30 second sequence. Relay RL_1 can have several sets of contacts to control several circuits if necessary. The B set of contacts on S_1 are used to open the circuit from the automatic keying relay. This set of contacts can be omitted from the circuit if one desires. Switch S_2 switches the transmitter keying circuit to either the automatic keying circuit or an external key. S_3 is used to set the station clock with WWV, a must for accurate sequencing. S_4 is used as a manual transmit switch when S_2 is in the manual position, such as when one must use break-in procedures.

The automatic keying portion of the circuit has been described in several journals previously. A tape loop with desired information is placed on a recorder and allowed to run continuously. Low impedance output from the recorder is fed to T_1 to step up the audio voltage which is then rectified by the 1N270 diode, filtered by the .05 capacitor and applied to the coil of relay RL_2. By adjusting the level on the recorder a very good reproduction of the code on the loop is obtained at RL_2, which is used to key the transmitter.

* P.O. Box 563, Boulder Colorado 80302



15 OR 30 SECOND METEOR SCATTER STATION SEQUENCER AND AUTOMATIC KEYER

OPEN BANDS

by Marilyn Wiseman, K8ALO

Plenty to report this issue. Thanks to all who have been so faithful keeping the mail box full. Hope the new year will be as successful. Best Season Greetings to all. Send your reports to me at Box 103, Petersburg, Ohio 44454.

50 Mhz. Scatter:

Oct.	K7BBO wrkd K7MKW (Idaho), W7UFB (Who.), plus 9 Calif. stations. WA7BTG (Wash.) wrkd W6NLO, W6GKO, K6NPC, K6RIL, WB6GKK (Calif.), K7ICW (Nev.) wrkd WØEYE (Colo.), WB6EIM/M, W6NLZ, WB6GKK (Calif.), hrd W7UFB, K7BBO, K7SVI, plus 5 Calif. stations. WB6GKK (Calif.), wrkd K7BBO (Wash.), K7CNK (Wash.), W7UFB (Wyo.) WØEYE (Colo.), WA5CZM (N.M.), K7ICW (Nev.).
Nov.	K1ABR (R.I.), wrkd K9KFR (Ind.), 600 mi. WB6GKK (Calif.) wrkd K7BBO(Wash.), WA5CZM (N.M.), W7UFB (Wyo.), W7CNK (Wash.), WØEYE (Colo.), K7ICW (Nev.), K6RIL (Calif.). K7BBO (Wash.) wrkd K6RIL, K6JC, K6HCP, plus many other Calif. stations. K7ICW (Nev.) reports small sporadic ES opening during leonids shower on the 15th and 16th. On the evening of the 17th, Al wrkd all call areas except W1, W2, W3's.

144 Mhz.

Oct. 2-23	K7ICW (Nev.) wrkd W6YVO, K6JYO, W6DQJ, W6NLZ, W6DNG, hrd K6TSK, K6HAA, W6NIZ.
Nov.	WB6GKK (Calif.) wrkd K6RIL, W6QWN, WB6IAG, WB6JEW all in San Francisco area, 400 mi. Gary has been running skeds Sun. morn., Mon. eve. with K6RIL,finding the path excellent with reports 459-559. Gary says 144 Mhz seems better than 50 Mhz.
Nov. 1-20	K7ICW (Nev.) wrkd K6IBY, K6JYO, K6MBY plus 4 other Calif. stations.
Dec. 1	K1ABR (R.I.) wrkd W8AEC (W.Va.) 450 mi.

144 Mhz. Scatter:

Oct. 3	K7ICW (Nev.) hrd K5WXZ (Tex.) 1064 mi. pings.
Oct. 19	W4CKB (Fla.) wrkd WA9DOT (Wisc.) orionids showers. K7ICW (Nev.) hrd K7ZIR (Ore.) 790 mi.
Oct. 20	K7ICW (Nev.) wrkd K6HAA (Calif.) hrd W7RQT (Utah).
Oct. 21	K7ICW (Nev.) hrd WØNXF (Neb.) 1100 mi., K7ZIR (Ore.). K7BBO (Wash.),hrd W6GDO.
Oct. 23	W4CKB (Fla.) wrkd W8PT (Mich.) orionids showers.
Nov. 3	K7ICW (Nev.) hrd W7RQT working K6HAA.
Nov. 5-6	K7ICW (Nev.) hrd WØNXF (Neb.) hrd call etc.
Nov. 7	K1ABR (R.I.) wrkd WA9DOT (Wisc.) 780 mi.

Nov. 17 (Leonids Shower)

1 K1ABR (R.I.) wrkd W5UGO/5 (Okla.) 1330 mi., W9IPA (Ill.), WØLER (Minn.) 1000 mi., WØDQY (Mo.) 1100 mi., hrd K4EJQ (Tenn.), W5WAX (Okla.), W4AWS (Fla.), K4IXC (Fla.), W4NUS (N.C.), W5UKQ(La.), KØEMO (Iowa), WØQDH and many more.

1 W1JSM (Mass.) wrkd WØCUC (S.D.) state #29 1300 mi, WØNXF (Neb.) state #30 1320 mi, K4EJQ (Tenn.) state #31 690 mi, W5UGO/5 (Okla. State #32, 1390 mi., K9AAJ, W9WDD, K9GZT (Ill), KØEMO (Iowa), hrd W4CKB, K4IYC, W4UHH, W4NUB, W8TIU, W9QXP, WA9DOT, W9IFA, K9SGD, KØMQS & many more. Don had skeds with several zeroes and fives, all reporting nothing heard.

2 K2HLA (N.Y.) wrkd K4EJQ (Tenn), W4NUS (N.C.), K9AAJ (Ill.), KØEMO (Iowa), WØLER (Minn.), W5WAX (Okla.), He heard W9IFA, W9WDD, W4MNT, W4CKB, W4TLA, W4AWS, W5UKQ, W5UGO/5, & W8PT.

3 W3GKP (Mc) wrkd W5UGO (Okla.) state #32, W5WAX (Okla.)

4 W4CKB (Fla.) wrkd WØNXF (Neb) state #25, 1300 mi, W3GKP (Md.) state 26, W3BDP (Del.) state #27, K4EJQ (Tenn) state #28, K4QIF, W4NUS (N.C.), W1HDQ, K1HTV (Conn.), W4LTU (Va.), W5UKQ (La.), W2AZL (N.J.). Bev says 10 of these stations were wrkd between 0620-0712 EST.

6 K6HAA wrkd WØBFB (Iowa), W5UGO (Okla.), WØYMG (Kans), W7RQT (Utah). WB6GKK wrkd K6BBO (Wash.), W7OKV (Ore.), hrd W7FS, K7ZIR, WA6STS.

7 W7JRG (Mont) wrkd W8QOH (Ohio) state #25. This was Ken's first Ohio station ever worked or heard. Hrd many others stations and considerable QRM.

.7 K7ICW (Nev) wrkd WØNXF (Neb.) for first Nev. Neb. 2 meter QSO, hrd WØBFB (Iowa) 1236 mi., WØEKZ (Kan) 1150 mi, WØEOZ (N.D.) 1215 mi.

7 K7ZIR (ore) wrkd W7RQT (Utah) 1 way of which was SSB, K6JYO (Fullerton) 2-way SSB, W6DNJ (L.A. area) & K6HCP (San Jose.) None of the contacts were on skeds.

Ø WØBFB (Iowa) wrkd K6HAA for first Iowa Calif & state #44. Hrd W2AZL, W1AZK, W2SFK off the back of the beam with S6 sigs. John has been on two for ten years and has never seen anything that would even approach the Leonids shower between 0400-0700 CST.

Dec. 14 (Geminids)

K5WXZ wrkd W8TIU, W5ORH (Okla.) wrkd W6GDO, W7RQT, W8PT, and K7ZIR (Ore.) wrkd K7ICW (Nev.)

Comments on the Leonids shower taken from a letter written by W4WNH/4.

The shower this year appeared different from last year's in several ways. First, there were <u>many</u> more stations on this year. It was impossible to count the number between 144.085 and 144.110. I could hear four in the 3.1 kc. passband of the 75A-3 at several settings of the dial. During the peak of the shower the panadaptor simply went wild, even tho there were more pings than bursts this year. During the peak period it appeared that there were often several pings per second, rather than the long bursts of last year. The pings were short and often very strong and very frequent. As many as ten signals would be seen on the panadaptor at one time. Then another ping would "grow another crop" on the scope. The pings were so short and so rapid at the peak that it sounded like a number of badly chopped signals. This and the QRM made copy difficult.

Skeds Wanted

WØBFB John R. Hinegardner, Mitchellville, Ia. 50169, would like 144 Mhz. skeds for Me., eastern Wash., Ore. and Idaho.
K4EJQ, J.G. "Bunky" Botts, Rt. 2, Box 72, Bristol, Tenn. would like to sked any station needing Tenn. Needs Fla., Ia., Ark., N.Y., Conn. Will answer all inquiries freq. 144.026 Mhz. c.w. 145.055 a.m. Sun and Thur. eve 1800-2330 EST.

K7BBO, Dave Robinson, 1716 S. 8th St., Tacoma, Wash. 98405 wants 144 Mhz. m/s skeds freq. 144.086 Mhz. Needs Ariz., Utah, Mont.

WA7BTG, Kim Coldevin, 3061 Northlake Way, Bremerton, Wash. 98310 wants 50 Mhz. skeds eve or after 0800 PST weekends. Freq. 50.016 Mhz. c.w. equip. HX30 to 4-250A SSB-CW Drake 2B - Parks conv. 8 ele HyGain 40'.

K1ABR, Dick Bromley, 12 High View Drive, Cranston, R.I. 02920 still looking for 50 Mhz. scatter skeds Sun. morn. 0700-1000 EST. CW or SSB. Rig KW xtal conv. HQ 180, 6 ele. wide space beam. Looking west and southwest. Also 144 Mhz. skeds rig KW 32 ele. Col. 717A-HQ 180.

K2HLA, Dick Wilborg, RFD #1, Cutchogue, L.I., N.Y. 11935 looking for 144 Mhz. skeds to Kans., La., Ark., Mo., Ga.

W3GKP, William L. Smith, 1525 Spencerville Rd., Spencerville, Md. 20868 wants 144 Mhz. skeds with Minn., N.D., S.D., Wyo., Colo., N.Mex., La., and points west. Willing to attempt via any propogation mode or build stuff for weak sig. readout. Any time or any day.

K4IQF, Rusty Holshouser, 1213 1/2 Dixie Trail, Raleigh, N.C. wants meteor scatter and tropo skeds with anyone. Freq. is 144.018. He moved and needs all states over again.

WØNXF, Bob Berk, 5218 Prescott, Lincoln, Nebr. wants half hour skeds with 15 sec. timing. His freq. 144.022. 1/2KW & ten el. Skybeam.

VHF NET

The regular Sunday night west coast VHF Net has expanded into a combination midwest and west-coast net. The midwest section starts at about 10 PM CST, the west coast section at 9PM--not necessarily the same freq. The freq. is 3810 plus 10 to minus 5 kc. QRM can be pretty rough on Sunday night and it can be hard to find a hole. SSB is the mode used. Many who check in are meteor-scatter types and almost all are DX typesCheck-ins are from most sections of Calif., from Oregon, Utah, Nevada, Colo., Texas, Kansas and Okla, Mich., Indiana etc. Backward states like Washington are seldom heard from. This is the time skeds are made, reception during previous skeds is discussed, etc. Usually there are 10 to 20 stations represented during the evening. 3810 Kc. is being used more frequently for liason during showers and tropo skeds. If you're serious about 2-meter DX and live in the midwest or west you ought to consider getting set up for 3810, SSB.

COMPARATIVE TIME CHART

Pacific Standard Time		Zebra Time	Mountain Standard	Central Standard	Eastern Standard
(1 AM)	0100	0900Z*	0200*	0300*	0400*
(2 AM)	0200	1000Z*	0300*	0400*	0500*
(3 AM)	0300	1100Z*	0400*	0500*	0600*
(4 AM)	0400	1200Z*	0500*	0600*	0700*
(5 AM)	0500	1300Z*	0600*	0700*	0800*
(6 AM)	0600	1400Z*	0700*	0800*	0900*
(7 AM)	0700	1500Z*	0800*	0900*	1000*
(8 AM)	0800	1600Z*	0900*	1000*	1100*
(9 AM)	0900	1700Z*	1000*	1100*	1200*
(10 AM)	1000	1800Z*	1100*	1200*	1300*
(11 AM)	1100	1900Z*	1200*	1300*	1400*
(12 AM)	1200	2000Z*	1300*	1400*	1500*
(1 PM)	1300	2100Z*	1400*	1500*	1600*
(2 PM)	1400	2200Z*	1500*	1600*	1700*
(3 PM)	1500	2300Z*	1600*	1700*	1800*
(4 PM)	1600	2400Z*	1700*	1800*	1900*
(5 PM)	1700	0100Z#	1800*	1900*	2000*
(6 PM)	1800	0200Z#	1900*	2000*	2100*
(7 PM)	1900	0300Z#	2000*	2100*	2200*
(8 PM)	2000	0400Z#	2100*	2200*	2300*
(9 PM)	2100	0500Z#	2200*	2300*	2400*
(10 PM)	2200	0600Z#	2300*	2400*	0100#
(11 PM)	2300	0700Z#	2400#	0100#	0200#
(12 PM)	2400	0800#	0100#	0200#	0300#

* Same date as Pacific Standard Time Date

\# Next day (as compared with PST). For example: 2000 PST the 15th of the month would be 0400Z the 16th of the month, or 160400Z.

144 MHz MS FREQUENCIES
by Al Olcott, K7ICW*

The Leonids meteor shower brought out the need for a more up to date listing of operating frequencies for meteor scatter work. Here are frequencies reported to be in use by active stations, but not necessarily including every call because a complete listing at this time is not available. Those who are active and not listed could send me up to date info for inclusion in the next listing.

144 MHz:

Call	State	Freq.	Call	State	Freq.
K6GCD	Cal.	.002	WØYMG	Kans.	.050
K2GUG	N.Y.	.003	W7RQT	Utah	.054
W9JGQ	Ill.	.005	K5WXZ	Tex.	.085
WB6KAP	Cal.	.009	K1BKK	Vt.	.085
W5UGO	Okla.	.012	W5GVE/4	Ala.	.085
W2AZL	N.J.	.012	K7BBO	Wash.	.086
W4FJ	Va.	.015	K7NII	Ariz.	.090
K4QIF	N.Car.	.018	WØEKZ	Kans.	.095
K2HLA	N.Y.	.019	WØEOZ	N.Dak.	.100
W7FS	Wash.	.020	K5TQP	N.Mex.	.100
K6HAA	Cal.	.020	WØBFB	Iowa	.110
WØNXF	Neb.	.022	W7UFB	Wyo.	.113
K7ZIR	Ore.	.022	W7MFP	Utah	.120
W6GDO	Cal.	.028	W4TLV	Ala.	.153
WØENC	S.Dak.	.033	K1ABR	R.I.	.175
K9AAJ	Ill.	.035	WØCUC	S.Dak.	.189
W8PT	Mich.	.037	WØLFE	Mo.	.220
K6KV	Cal.	.040	W8BKI	W.Va.	.257
WØEYE	Colo.	.042	W8KAY	Ohio	.300
W1JSM	Mass.	.046	K7ICW	Nev.	VFO
W9WDD	Ill.	.050	K7MKW	Ida.	VFO

* 510 S. Rose St., Las Vegas, Nev. 89106

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419 S.W. First
Beaverton, Ore. 97005

J.J. O'BRIEN 6-69-1 (4)
6606 FIFTH STREET
RIO LINDA, CALIF. 95673

Return Requested